

3.2

Adding Rational Numbers

FOCUS

- Solve problems that require adding rational numbers.

At 6 A.M., the temperature was -3°C . By 10 A.M., the temperature had risen by 6°C . How can you use a number line to determine the temperature at 10 A.M.?



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Example 1

Adding Rational Numbers in Fraction and Mixed Number Form

Evaluate.

a) $-\frac{5}{8} + \left(-\frac{7}{2}\right)$ b) $-\frac{1}{4} + 2\frac{1}{6}$

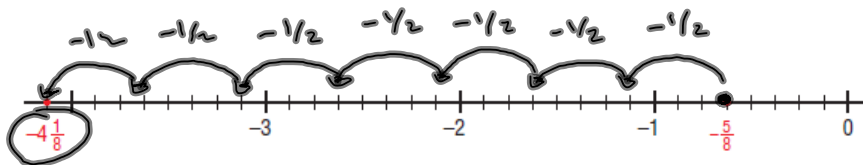
SOLUTION:

A) $-\frac{5}{8} + \left(-\frac{7}{2}\right)$

Method 1:

$$-\frac{5}{8} + \left[-\frac{28}{8}\right] = -\frac{33}{8} = \boxed{-4\frac{1}{8}}$$

Method 2:



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Example 1 Adding Rational Numbers in Fraction and Mixed Number Form

Evaluate.

a) $-\frac{5}{8} + \left(-\frac{7}{2}\right)$ b) $-\frac{1}{4} + 2\frac{1}{6}$

SOLUTION:

B) $-\frac{1}{4} + 2\frac{1}{6}$

$$-\frac{1}{4} + \frac{13}{6}$$

$$-\frac{3}{12} + \frac{26}{12}$$

$$\frac{23}{12} = 1\frac{11}{12}$$

STEPS:

Step 1: Change mixed fraction to an improper

Step 2: Find a common denominator.

Step 3: Add the fractions

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Example 2 Adding Rational Numbers in Mixed Number Form

Evaluate.

$-\frac{10}{3} + 2\frac{5}{6}$

SOLUTION:

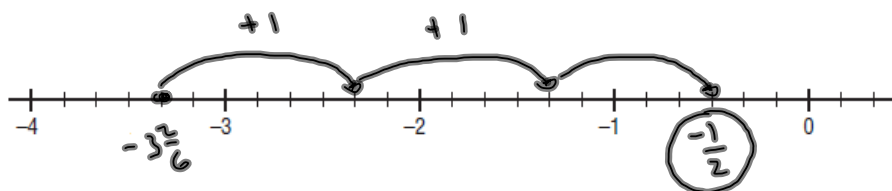
$$-\frac{10}{3} + 2\frac{5}{6}$$

Method 1:

$$-\frac{10}{3} + \frac{17}{6} = \frac{-20}{6} + \frac{17}{6} = \frac{-3}{6} = \boxed{-\frac{1}{2}}$$

Method 2:

$$-3\frac{1}{3} = -3\frac{2}{6}$$



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Example 3 Solving a Problem by Adding Rational Numbers

At the beginning of June, the Frosty Snow Blower Company was \$235.46 in debt.

By the end of August, the company had increased its debt by \$156.71.

- Use a rational number to represent each amount.
- Calculate how much the company owed at the end of August.

SOLUTION:

A) Use a rational number to represent each amount

$$\begin{array}{r} -156.71 \\ - 235.46 \end{array}$$

B) Calculate how much the company owed at the end of August.

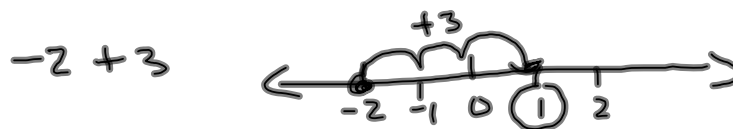
$$\begin{array}{r} -235.46 + (-156.71) \\ -392.17 \end{array}$$

At the end of August they owe \$ 392.17

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Discuss the ideas

- How can you use what you know about representing the sum of 2 integers on a number line to add 2 rational numbers?
- How can you use what you know about adding integers and adding fractions to add 2 rational numbers in fraction form?



Reflect

Before you add 2 rational numbers, how can you tell if their sum will be positive or negative? Include both fraction and decimal examples in your explanation.

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Practice

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If Finished in class then attempt these questions

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